AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (previously presented): A lithographic process for forming a pattern (20) in relief on a mass (10) of polymeric material for use in micro-devices and nano-devices, the process comprising the steps of:

preparing said mass (10) of polymeric material and a die (12) having a surface region (14) facing towards said mass (10) of polymeric material and which reproduces in negative said pattern in relief (20),

heating said die (12) and putting said mass (10) of polymeric material into contact with the die (12) in any temporal sequence in such a way that the parts of said mass (10) of the polymeric material in contact with said surface region (14) are subject to softening, and

separating said die (12) from the mass (10) of polymeric material on the surface of which said pattern in relief (20) has been formed,

wherein the heating of at least part of the die (12) is obtained by the generation of thermal energy upon dissipation of another form of energy in at least one region (16) of said die (12),

wherein said region (16) of said die (12) in which thermal energy is generated remains for less than 25 seconds and

wherein said region (16) of the die (12) in which thermal energy is generated is in the form of a layer.

2. (previously presented): A process according to Claim 1, wherein said mass (10) of polymeric material has a three-dimensional form.

3. (previously presented): A process according to Claim 1, wherein the region (16) in which energy is dissipated with consequent generation of heat is at a smaller distance than 100 μm from the surface carrying the pattern in relief of said die (12).

4. (previously presented): A process according to Claim 1, wherein said mass (10) of polymeric material has a two-dimensional form and is in the form of a sheet or thin film deposited on a substrate (22).

5. (previously presented): A process according to claim 1, wherein the region (16) of said die (12) in which thermal energy is generated remains for less than 50 milliseconds, at a temperature greater than or equal to the glass transition temperature of the polymeric material (10).

6. (previously presented): A process according to claim 1, wherein it includes a plurality of successive cycles of heating, contacting and separation.

7. (previously presented): A process according to claim 1, wherein the heating phase includes a plurality of short successive cycles in such a way that the impression of the pattern is the result of a series of successive indentations of the die (12).

8. (previously presented): A process according to claim 1, wherein the steps of heating the region (16) of the die (12) and contacting it with the mass (10) of polymeric material are synchronized.

9. (previously presented): A process according to claim 1, wherein said die (12) is put into contact under pressure with the mass (10) of polymeric material.

10. (previously presented): A process according to Claim 9, wherein said pressure is exerted in a pulsed manner.

11. (previously presented): A process according to claim 9, wherein said pressure is obtained mechanically, or with electrostatic, magnetic, electromagnetic forces and/or with acoustic shock waves.

12. (previously presented): A process according to claim 1, wherein said die (12) is pre-heated to a desired temperature.

13. (previously presented): A process according to claim 1, wherein the quantity of thermal energy generated varies locally within said region (16) of the die (12).

14. (previously presented): A process according to claim 1, wherein said polymeric material (10) is of thermoplastic type.

15. (previously presented): A process according to Claim 14, wherein said polymeric material (10) is chosen from the group consisting of polycarbonates, polymethylmethacrylates, polyethylene terephthalates, polyethylmethacrylates, polybutylene terephthalates, polyolefins and their mixtures.

16. (previously presented): A process according to claim 1, wherein at least one portion of the surface of the die (12) is clad with a release agent.

17. (previously presented): A process according to claim 1, wherein, after the pattern (20) in relief has been formed on the surface of the mass (10) of polymeric material, a treatment is performed with an attack agent so as to remove the polymeric material (10) where it has been compressed.

18. (previously presented): A process according to claim 1, wherein the surface region (14) of the die (12) which reproduces the pattern in relief in negative is aligned with pre-existing reference signs on the mass (10) of polymeric material or, if said material (10) is a thin film, on the substrate (22) on which said film is deposited.

19. (previously presented): A process according to claim 1, wherein said region (16) of the die (12) in which thermal energy is generated is of electrically conductive material.

20. (previously presented): A process according to Claim 19, wherein the energy dissipated in heat is provided by an electric current (18) which flows in said electrically conductive material.

21. (currently amended): A process according to Claim 20, wherein the direction of flow of said electric current (18) is substantially perpendicular to the direction of relative movement of the mass (10) of polymeric material and the die (12).

22. (previously presented): A process according to claim 1, wherein said region (16) of the die (12) in which thermal energy is generated coincides with said surface region (14) which reproduces said pattern in relief in negative.

23. (canceled).

24. (previously presented): A process according to Claim 1, wherein said layer has a thickness less than 2 μm.

25. (previously presented): A process according to Claim 1, wherein said layer has a non-uniform thickness in such a way that it is possible locally to vary the quantity of thermal energy generated.

26. (canceled).

27. (currently amended): A process according to claim 19, wherein said electrically conductive material is a metal~~, preferably chosen from the group consisting of Ti, Ni, Cr, Cu, Ag, Au, W, Ir, Ta, Pd, Mo, V and their alloys~~.

28. (previously presented): A process according to claim 19, wherein said electrically conductive material is a semi-conductor.

29. (previously presented): A process according to claim 1, wherein said layer of electrically conductive material is obtained by doping a surface layer (16) of an intrinsically semiconductive or initially lightly-doped substrate, in such a way as to increase its conductivity with respect to the underlying portion (24) of the substrate.

30. (previously presented): A process according to Claim 29, wherein said layer (16) to be doped is the outermost layer of silicon of a silicon-on-insulator (SOI) structure.

31. (previously presented): A process according to Claim 29, wherein the doping operation is performed by ion implantation.

32. (canceled).

33. (previously presented): A process according to claim 20, wherein said electric current (18) is induced by applying a potential difference between at least two electrodes (26) connected to said electrically conductive material.

34. (previously presented): A process according to claim 20, wherein said electric current (18) is induced by a variable magnetic field.

35. (canceled).

36. (canceled).

37. (withdrawn): A die for performing a process according to claim 1, comprising at least one region (16) capable of generating thermal energy upon dissipation of another form of energy.

38. (withdrawn): A die according to Claim 37, further including an inner thermally insulating layer.

39. (previously presented): A process according to claim 27, wherein said metal is preferably chosen from the group consisting of Ti, Ni, Cr, Cu, Ag, Au, W, Ir, Ta, Pd, Mo, V and their alloys.

40. (previously presented): A process according to claim 28, wherein said semi-conductor is silicon.